

Name: \_\_\_\_\_

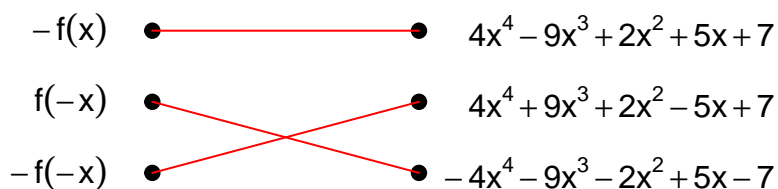
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**Exam: Function Reflections (Solution version 44)**

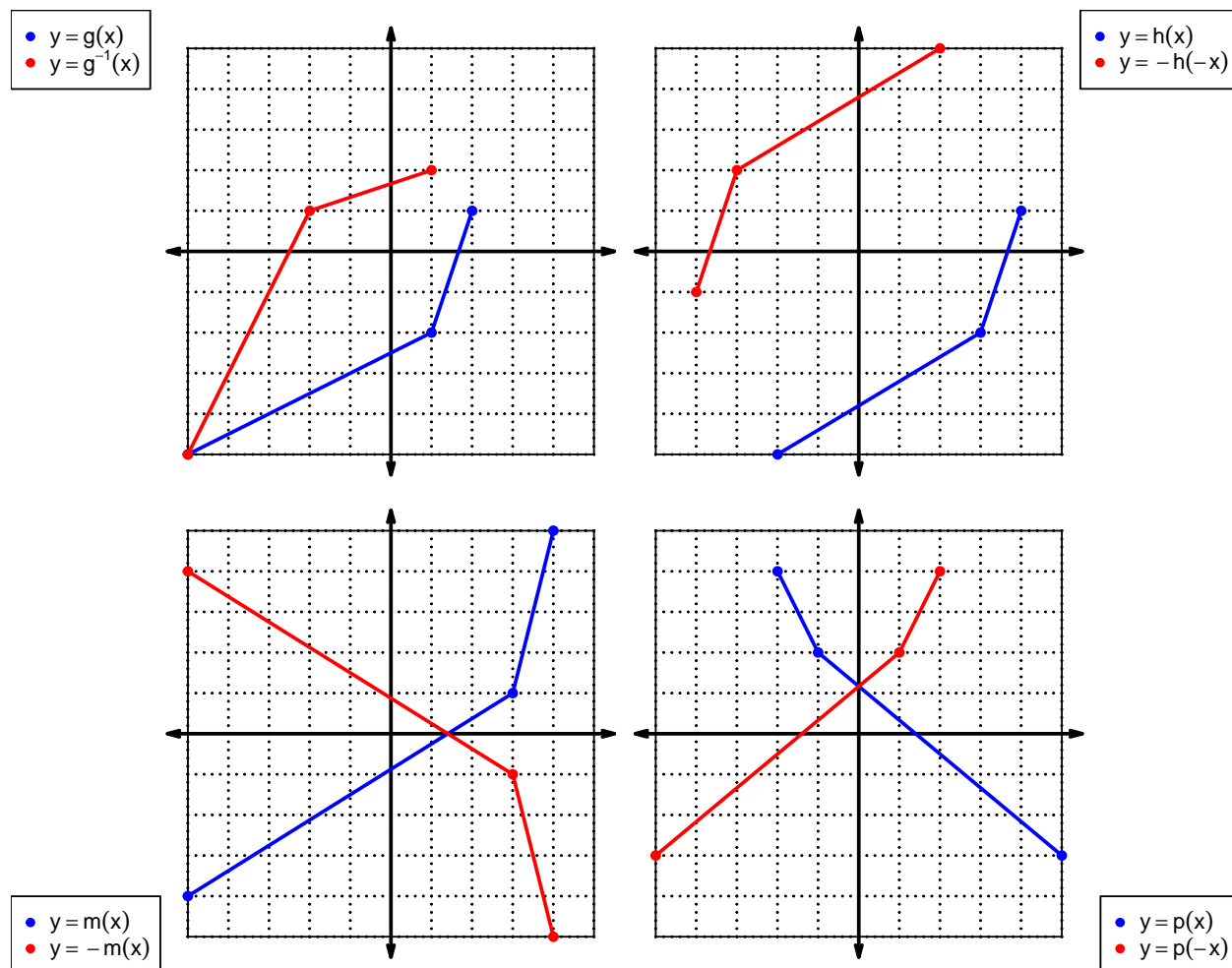
1. Let function  $f$  be defined by the polynomial below:

$$f(x) = -4x^4 + 9x^3 - 2x^2 - 5x - 7$$

Draw lines that match each function reflection with its polynomial:

**Reflections****Polynomials**

2. In each  $xy$  plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The  $x$  axis is horizontal and the  $y$  axis is vertical (as typical), and the scale is equal on both axes.



## Exam: Function Reflections (Solution version 44)

For all questions on this page, the functions  $f$ ,  $g$ , and  $h$  are defined by the table below.

$x$	$f(x)$	$g(x)$	$h(x)$
1	8	7	6
2	5	1	9
3	4	9	2
4	6	2	5
5	1	3	7
6	9	5	4
7	2	4	8
8	3	6	1
9	7	8	3

3. Evaluate  $h(5)$ .

$$h(5) = 7$$

4. Evaluate  $g^{-1}(8)$ .

$$g^{-1}(8) = 9$$

5. Assuming  $g$  is an **odd** function, evaluate  $g(-6)$ .

If function  $g$  is odd, then

$$g(-6) = -5$$

6. Assuming  $f$  is an **even** function, evaluate  $f(-3)$ .

If function  $f$  is even, then

$$f(-3) = 4$$

## Exam: Function Reflections (Solution version 44)

7. A function,  $f$ , is **even** if  $f(x) = f(-x)$  for all  $x$  in the domain. A function,  $g$ , is **odd** if  $g(x) = -g(-x)$  for all  $x$  in the domain.

Let polynomial  $p$  be defined with the following equation:

$$p(x) = x^2 - x$$

- a. Express  $p(-x)$  as a polynomial in standard form.

$$p(-x) = (-x)^2 - (-x)$$

$$p(-x) = x^2 + x$$

- b. Express  $-p(-x)$  as a polynomial in standard form.

$$-p(-x) = -(x^2 + x)$$

$$-p(-x) = -x^2 - x$$

- c. Is polynomial  $p$  even, odd, or neither?

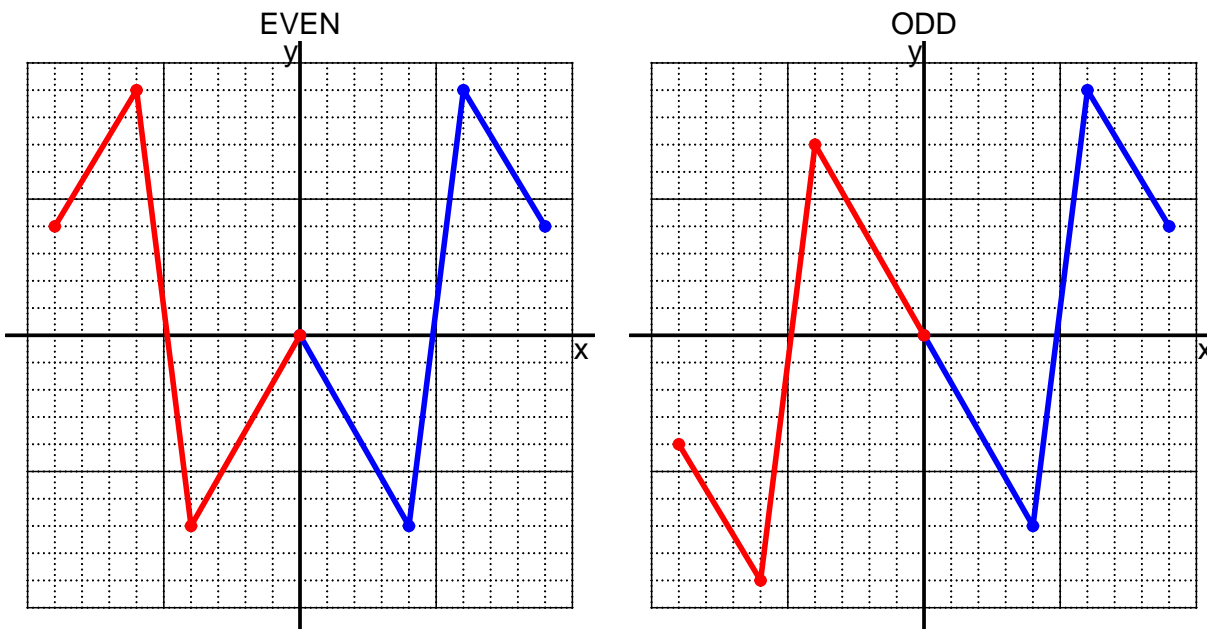
neither

- d. Explain how you know the answer to part c.

We see that  $p(x)$  is not equivalent to either  $p(-x)$  or  $-p(-x)$ , so  $p$  is neither even nor odd.

## Exam: Function Reflections (Solution version 44)

8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function  $f$  be defined with the equation below.

$$f(x) = 2(x + 6)$$

a. Evaluate  $f(10)$ .

step 1: add 6  
step 2: multiply by 2

$$f(10) = 2((10) + 6)$$

$$f(10) = 32$$

b. Evaluate  $f^{-1}(94)$ .

step 1: divide by 2  
step 2: subtract 6

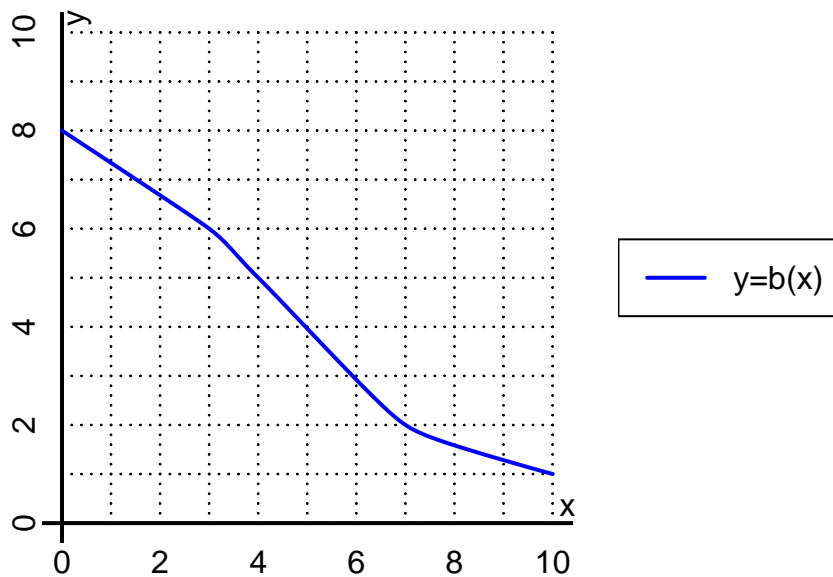
$$f^{-1}(x) = \frac{x}{2} - 6$$

$$f^{-1}(94) = \frac{(94)}{2} - 6$$

$$f^{-1}(94) = 41$$

## Exam: Function Reflections (Solution version 44)

10. The function  $b$  is represented by the curve  $y = b(x)$  graphed below.



a. Evaluate  $b(4)$ .

$$b(4) = 5$$

b. Evaluate  $b^{-1}(6)$ .

$$b^{-1}(6) = 3$$

## Exam: Function Reflections (Solution version 44)

11. Function  $f$  is defined by the table below.

a. Complete the columns for  $-f(x)$  and  $f(-x)$  and  $-f(-x)$ .

$x$	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-4	4	4	-4
-1	3	-3	-3	3
0	0	0	0	0
1	-3	3	3	-3
2	4	-4	-4	4

b. Is function  $f$  even, odd, or neither?

odd

c. How do you know the answer to part b?

Function  $f$  is odd because column  $-f(-x)$  matches column  $f(x)$  exactly.